SIXTEENTH PROGRESS REPORT

on

CALIBRATION AND EVALUATION OF SKYLAB ALTIMETRY FOR GEODETIC DETERMINATION OF THE GEOID (Contract NAS9-13276, EPN 440) June 1 to June 30, 1974

to

NASA Johnson Space Center
Principal Investigation Management Office
Houston, Texas 77058

from

BATTELLE

Columbus Laboratories

July 17, 1974

Prepared by: D. M. J. Fubara (Co-Investigator)
and M. B. Kuhner

A. G. Mourad (Principal Investigator)
Z. H. Byrns, Code TF6 - NASA/JSC Technical Monitor

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PROGRESS

We continued the effort initiated in the last reporting period, aimed at (a) matching altimetry data from CCT S071-1 tapes with ephemeris data from SKYBET tapes, and (b) development of a computer program to plot graphs of altimeter-derived geoid heights directly from the analytical processing. For reasons given in the last progress report, a low effort on this project continues to be maintained.

Documents and data received and reviewed during this period are listed in Appendix A.

DATA PROCESSING RESULTS

There are no significant results to be reported at this time.

PROBLEMS

We have found that the S071-1 CCT does not have the Skylab ECI or ECT coordinates. The following pages from PHO-TR524 and PHO-TR543 constitute the basis of our interpretation. Page 7-23 of PHO-TR524 and page 5.5-1 of PHO-TR543 describe, verbally, the contents of S071-1 CCT. Pages 5.5.2-2 through 5.5.2-13 of PHO-TR543 describe the actual records or contents of S071-1 CCT. According to pages 4.0-5 to 4.0-10 of PHO-TR543 which describe the contents of SKYBET tapes, the Skylab coordinates or ephemeris data that we need are either those captioned P007-SKY through P012-SKY (the ECI coordinates) or P013-SKY through P018-SKY (the ECT coordinates). An examination of all these cited pages indicates that S071-1 CCT does NOT contain the data P007-SKY through P018-SKY. The only ephemeris related data on S071-1 CCT are (a) P071-SKY through P073-SKY and (b) P023-SKY, P025-SKY and P026-SKY. The former, set (a), are merely angular values of OWS with respect to ZLV, while the set (b) data (geodetic longitude, altitude and latitude) could have been a valid substitute for the ECT coordinates but for the poor precision in the conversion from the ECT coordinates to the geodetic ellipsoidal coordinates. This imprecision was discussed in our Fifth, Sixth and Seventh progress reports and was also confirmed by Bill Wollenhaupt and his Memorandum PM85(73-241) of October 2, 1973, entitled "Status of Skylab SL-2 EREP SKYBET Tapes".

This lack of availability of the required ECT coordinates and our having to depend on the P023-, P025-, P026-SKY will introduce both random and systematic errors into our final results. We can effectively recover and eliminate the effects of the systematic errors and hope that the random errors are small and can be accommodated by our least squares processing. We are, therefore, hopeful of achieving most of our objectives in spite of these conditions.

RECOMMENDATION

There are no new recommendations. Some of the previous ones that have not been acted upon are still being recommended.

NEXT PERIOD AND SUMMARY OUTLOOK

A low effort will be maintained towards completion of work already in progress. Normal effort will be resumed as soon as the additional funding support is implemented.

TRAVEL

There was no travel during this period. Anticipated travel for the next period will involve travel to NASA/JSC, Houston to attend the PI meeting on status of EREP data.

APPENDIX A

REPORTS AND DATA RECEIVED

	Title	Identification Number	No. of Copies
(1)	MEMORANDUM 5-23-74 From: FM85 (74-160) Mission Planning and Analysis Division Subject: Status of Skylab Attitude Reconstruction Task		1
(2)	EARTH RESOURCES PROGRAM RESULTS AND PROJECTED APPLICATIONS ERTS-1 APPLICATIONS INVESTIGATIONS	May, 1974 Volume 1 Edited by O. G. Smith and H. Granger Earth Resources Program Office	1
(3)	SKYLAB 4 S190B 461636 2X Prints - 1 each Mag: 92 209/222	(Photographic Technology Div.) Job. No. 4663	1
(4)	SKYLAB IV/EREP DATA BOOKS DDC Accession No. 34-25480 Processed From Microfilm Roll No. 34-17661 DPAR No. S190B-86-1-54-32-1		1
(5)	W/O #3951 SL4 S190A 461636 461536 PI 70-mm TRANSPARENCIES - 1 each POS Mag: 52 70 A4 083/090 194/207 366/484 Mag: A4 stops at frame 462		1